

## FURTHER COMMENTS ON "THE FIRST WATERSPOUT DISCOVERED ON SATELLITE PHOTOGRAPHS"

L. F. HUBERT

U.S. Weather Bureau, Washington, D.C.  
November 1, 1962

My recent article [1] has been the subject of a private communication from Mr. John Conover of the Air Force Cambridge Research Laboratories, Bedford, Mass. Mr. Conover also has a black and white copy of the original color film and when the interesting feature discussed in my article was pointed out to him he examined the film and then took it to the photointerpreters at Itek Corporation. Mr. Conover and the Itek interpreters are of the opinion that the feature under discussion was a shadow and not a waterspout.

The Itek interpreters viewed this cloud mass on successive stereo pairs so that several different aspects were visible as the camera passed around the feature in question. The dark hole in the "doughnut" surmounting the "spout" was displaced farther away from the "spout" on later pairs, and the "spout" was located nearer the camera than the cloud tower that provides the light background.

Mr. Conover interprets the formation as follows: "Snow is falling from all of these [of the several bulges on the cumulonimbus], and shadows are on the side of each mass. Another surge causes the column to bulge toward the viewer at [a position just below the arrowhead on "a"

my fig. 2]. This is highlighted, thus cutting off the dark shadow beyond. Such combinations of light and dark can make sharp shadows; many of these appear (e.g., the comma shape at 7 o'clock from "d" in your fig. 2.)"

I have since examined color transparencies under stereoscope and still feel it *could be* a vortex tube as discussed in my original article even in view of the analysis from Itek. On the other hand the opposing interpretation has been made by some very experienced and capable interpreters and their opinion cannot be disregarded. The fact that we have this fundamental disagreement in interpretation points up the fact that interpretation even of such a high quality picture as this is a subjective affair and I suspect that even extended discussion might leave them still with their opinion and me with mine. I think I shall herewith withdraw from the argument and let the readers decide for themselves. Whatever interpretation is correct I think all will agree these are indeed unusual and interesting data.

### REFERENCE

1. L. F. Hubert, "The First Waterspout Discovered on Satellite Photographs," *Monthly Weather Review*, vol. 90, No. 9, Sept. 1962, pp. 382-384.